SEQUENCE LISTING

<110> COMPUGEN LTD.

<120> NOVEL NUCLEIC ACID AND AMINO ACID SEQUENCES

<130> 1306414- COMPUGEN

<140>
<141>

<150> IL 126587
<151> 1999-02-18

<150> IL 129439
<151> 1999-04-14

<150> IL 131363
<151> 1999-08-11

<160> 12

<170> PatentIn Ver. 2.1

<210> 1
<211> 4661
<212> DNA
<213> Homo sapiens

<400> 1
attttgcatg ccaccttaat ctttttttct ttttttttaa atcgaggttt cagtctcatt 60
ctatttccca ggctggagtt caatagcgtg atcacagctc actgtagcct tgaactcctg 120
gccttaagag attcttcctgc ttcggtctcc caatagctaa gactacagta gtccaccacc 180
atatccagat aatttttaaa ttttttgggg ggcccggcac agtggctcac gcctgtaatc 240
ccaacaccat gggaggctga gatgggtgga tcacgaggtc aggagtttga gaccagcctg 300
accaacatgg tgaaacctg tctctactaa aaaaaaaaaa aatagaaaaa ttagccgggc 360
gtggtggcac acggcacctg taatcccagc tactgaggag gctgaggcag gagaatcact 420
tgaacccaga aggcagaggt tgcaatgagc cgagattgcg ccactgcact ccagcctggg 480
tgacagagtg agactctgtc tcaaaaaaaa aaaatttttt ttttttttct gtagagatgg 540
atcttgcttt gtttcttgg ttggccttga actcctggct tcaagtgatc ctcctacctt 600
ggcctcggaa agtgttggga ttacaggcgt gagccaccat gactgacctg tcgttaatct 660
tgaggtacat aaaactggct cctaaaggct aaaggctaaa tatttgttgg agaaggggca 720
ttggattttg catgaggatg attctgacct gcgagggcag gtcagcaggc atctctgttg 780
cacagataga gtgtacaggt ctggagaaca aggagtgggg ggttattgga attccacatt 840
gtttgctgca cgttggattt tgaaatgcta gcgaactttg ggagactcat atttctgggc 900
tagaggatct gtggaccaca agatcttttt atgatgacag tagcaatgta tctgtggagc 960
tggattctgg gttgggagtg caaggaaaag aatgtactaa atgccaagac atctatttca 1020
ggagcatgag gaataaaagt tctagtttct ggtctcagag tggtgcaggg atcagggagt 1080
ctcacaatct cctgagtgct ggtgtcttag ggcacactgg gtcttggagt gcaaaggatc 1140
taggcacgtg aggctttgta tgaagaatcg gggatcgtac ccaccccctg tttctgtttc 1200
atcctgggcg tgtctcctct gccttttgtcc cctagatgaa gtctccatga gctacagggc 1260
atggtgcatc cagggtgatc tagtaattgc agaacagcaa gtactagctc tcccttcccct 1320
tccacagctc tgggtgtggg aggggttgt ccagcctcca gcagcatggg gagggccttg 1380
gtcagcctct cggtgccagc acggcagggg cggagtcctg gggaatgaag gttttatagg 1440
gctcctgggg gaggctcccc agccccaagc ttaccacctg cacccggaga gctgtgtcac 1500
catgtgggtc cnggttgtct tcctcaccct gtccgtgacg tggattggtg agaggggcca 1560
tggttggggg gatgcaggag agggagccag ccctgactgt caagctgagg cttctttccc 1620
cccaacccag cacccccagcc cagacaggga gctgggctct tttctgtctc tcccagcccc 1680
actccaagcc catacccccca gccccctccat attgcaacag tcctcactcc cacaccaggt 1740
ccccgctccc tcccacttac cccagaactt tctccccatt gcccagccag ctccctgctc 1800
ccagctgctt tactaaaggg gaagttcctg ggcatctccg tgtttctctt tgtgggggtc 1860

```
aaaacctcca aggacctctc tcaatgccat tggttccttg gaccgtatca ctggtccacc 1920
tcctgaggcc ctcaatccta tcacagtcta ctgacttttc ccattcagct gtgagtgccc 1980
aaccctatcc cagagacctt gatgcttggc ctcccaatct tgccctagga tacccagatg 2040
ccaaccagac acctccttct tcctagccag gctatctggc ctgagacaac aaatgggtcc 2100
ctcagtctgg caatgggact ctgagaactc ctcattccct gactcttagc cccagactct 2160
tcattcagtg gcccacattt tccttaggaa aaacatgagc atccccagcc acaactgcca 2220
gctctctgat tccccaaatc tgcatccttt tcaaaacctg aaaacaaaaa gaaaaacaaa 2280
taaaacaaaa ccaactcaga ccagaactgt tttctcaacc tgggacttcc taaactttcc 2340
aaaaccttcc tcttccagca actgaacctc gccataaggc acttatccct ggttcctagc 2400
accccttatc cgctcagaat ccacaacttg taccaagttt cccttctccc agtccaagac 2460
cccaaatcac cacaaaggac ccaatcccca gactcaagat atggtctggg cgctgtcttg 2520
tgtctcctac cctgatccct gggttcaact ctgctcccag agcatgaagc ctctccacca 2580
gcaccagcca ccaacctgca aacctaggga agattgacag aattcccagc ctttcccagc 2640
tcccccctgcc catgtcccag gactcccagc cttggttctc tgccccctg tcttttcaaa 2700
cccacatcct aaatccatct cctatccgag tcccccagtt cctcctgtca accctgattc 2760
ccctgatcta gcaccccctc tgcaggtgct gcaccctca tcctgtctcg gattgtggga 2820
ggctgggagt gcgagaagca ttcccaaccc tggcaggtgc ttgtggcctc tcgtggcagg 2880
gcagtctgcg gcgggtgttct ggtgcacccc cagtgggtcc tcacagctgc ccactgcatc 2940
aggaacaaaa gcgtgatctt gctgggtcgg cacagcctgt ttcatcctga agacacaggc 3000
caggtatttc aggtcagcca cagcttccca cacccgctct acgatatgag cctcctgaag 3060
aatcgattcc tcaggccagg tgatgactcc agccacgacc tcatgctgct ccgcctgtca 3120
gagcctgccg agctcacgga tgctgtgaag gtcatggacc tgcccaccca ggagccagca 3180
ctggggaccg cctgctacgc ctcaggctgg ggcagcattg aaccagagga gttcttgacc 3240
ccaaagaaac ttcagtgtgt ggacctccat gttatttcca atgacgtgtg tgcgcaagtt 3300
cacgctcaga aggtgaccaa gttcatgctg tgtgctggac gctggacagg gggcaaaagc 3360
acctgctcgg gtgattctgg gggcccactt gtctgtaatg gtgtgcttca aggtatcacg 3420
tcatggggca gtgnaccatg tgccctgccc gaaaggcctt ccctgtacac caaggtggtg 3480
cattaccgga agtggatcaa ggacaccatc gtggccaacc cctgagcacc cctatcaact 3540
ccctattgta gtaaacttgg aaccttggaa atgaccaggc caagactcaa gcctccccag 3600
ttctactgac ctttgtcctt aggtgtgagg tccagggttg ctaggaaaag aaatcagcag 3660
acacaggtgt agaccagagt gtttcttaaa tggtgtaatt ttgtcctctc tgtgtcctgg 3720
ggaatactgg ccatgcctgg agacatatca ctcaatttct ctgaggacac agataggatg 3780
gggtgtctgt gttatttgtg ggrtacagag atgaaagagg ggtgggwwcc acactgagag 3840
agtggagagt gacatgtgct ggacactgtc catgaagcac tgagcagaag ctggaggcac 3900
aagcaccag acactcacag caaggatgga gctgaaaaca taacccactc tgtcctggag 3960
gcactgggaa gcctagagaa ggctgtgagc caaggaggga gggtcttcct ttggcatggg 4020
atgggggatga agtaaggaga gggactggac cccctggaag ctgattcact atgggggggag 4080
gtgnattgaa gtcctccaga caaccctcag atttgatgat ttcctagtag aactcacaga 4140
aataaagagc tnttatacgt ggtttattct ggtttgttac attgacagga gacacactga 4200
aatcagcaaa ggaaacaggc atctaagtgg ggatgtgaag aaaacaggga aaatctttca 4260
gttgtttttt cccagtgggg tgttgtggac agcacttaaa tcacacagaa gtgatgtgtg 4320
accttgtgta tgaagtattt ccaactaagg aagctcacct gagccttagt gtccagagtt 4380
cttattgggg gtctgtagga taggcatggg gtactggaat agctgacctt aacttctcag 4440
acctgaggtt cccaagagtn caagcagata cagcatggcc tagagcctca gatgtacaaa 4500
aacaggcatt catnatgaat cgcactgtta gcatgaatca tctggcacgg cccaaggccc 4560
caggtatacc aaggcacttg ggccgaatgt tccaaggcat taaatgtcat ctcccaggag 4620
ttattcaagg gtgagccctg tacttggaac gttcaggctt t                    4661
```

<210> 2
<211> 4661
<212> DNA
<213> Homo sapiens

<400> 2

```
attttgcatg ccaccttaat cttttttttt ttttttttaa atcgaggttt cagtctcatt 60
ctatttccca ggctggagtt caatagcgtg atcacagctc actgtagcct tgaactcctg 120
gccttaagag attctcctgc ttcggtctcc caatagctaa gactacagta gtccaccacc 180
atatccagat aatttttaaa ttttttgggg ggccgggcac agtggctcac gcctgtaatc 240
ccaacaccat gggaggctga gatgggtgga tcacgaggtc aggagtttga gaccagcctg 300
accaacatgg tgaaaccctg tctctactaa aaaaaaaaaa aatagaaaaa ttagccgggc 360
```

```
gtggtggcac acggcacctg taatcccagc tactgaggag gctgaggcag gagaatcact 420
tgaacccaga aggcagaggt tgcaatgagc cgagattgcg ccactgcact ccagcctggg 480
tgacagagtg agactctgtc tcaaaaaaaa aaaatttttt tttttttttt gtagagatgg 540
atcttgccat gttgcccagg ttggtcttga actcctggct tcaagtgatc ctcctacctt 600
ggcctcccaa agtgttggga ttacaggcgt gagccaccat gactgacctg tcgttaatct 660
tcaggtatat aaacctggcc cctaaaggct aaaggctaaa tatttgttgg agaagggcca 720
ttggattttg catgaggatg attctgacct gggagggcag gtcagcaggc atctctgttg 780
cacagatagg gtgtacaggt ctggagaaca aggagtgggg ggttattgga attccacatt 840
gtttgctgca agttggattt tgaaatgcta gggaactttg ggagactcat atttctgggc 900
tagaggatct ctggacccaa agatcttttt atgatgacag tagcaatgta ttgtggagc 960
tggattctgg gttgggagtg caaggaaaag aatgtactaa atgccaagac atctatttca 1020
ggagcatgag gaataaaagt tctagtttct ggtctcagag tggtgcaggg atcagggagt 1080
ctcacaatct cctgagtgct ggtgtcttag ggcacactgg gtcttggagt gcaaaggatc 1140
taggcacgtg aggctttgta tgaagaatcg gggatcgtac ccacccctg tttctgtttc 1200
atcctgggcg tgtctcctct gcctttgtcc cctagatgaa gtctccatga gctacagggc 1260
ctggtgcatc cagggtgatc tagtaatttgc agaacagcaa gtactagctc tccctcccct 1320
ctcacagctc tgggtgtggg aggggcttgt ccagcctcca gcagcatggg gagggccttg 1380
gtcagcctct gggtgccagc agggcagggg cggagtcctg gggaatgaag gttttatagg 1440
gctcctgggg gaggctcccc agccccaagc ttaccacctg cacccggaga gctgtgtcac 1500
catgtggctc cgggttgtct tcctcaccct gtccgtgacg tggattggtg agagggccca 1560
tggttgcggg gatgcaggag agggagccag ccctgactgt caagctgagg ctctttcccc 1620
cccaacccag cacccccagcc cagacaggga gctgggctct tttctgtctc tcccagcccc 1680
agtccaagcc catacccccc gcccctccat attgcaacag tcctcactcc cacaccaggt 1740
ccccgctccc tcccacttac cccagaactt ntctcccatt gcccagccag ctccctgctc 1800
ccagctgctt tactaaaggg gaagttcctg ggcatctccg tgtttctctt tgtggggctc 1860
aaaacctcca agcacctctc tcaatgccat tggttccttg gaccgtatca ctggtccacc 1920
tcctgaggcc ctcactccta tcacagtcta ctgacttttc ccattcagct gtgagtgccc 1980
aaccctatcc cagagacctt gatgcttggc ctcccaatct tgccctagga tacccagatg 2040
ccaaccagac acctccttct tcctagccag gctatctggc ctgagacaac aaatgggtcc 2100
ctcagtctgg cnatgggact ctgagaactc ctcattccct gactcttagc cccagactct 2160
tcattcagtg gcccacattt tccttaggaa aaacatgagc atccccagcc acaactgcca 2220
gctctctgat tcccaaatc tgcatccttt tcaaaaccta aaaacaaaaa caaaaacaaa 2280
taaaacaaaa ccaactcaga ccagaactgt tttctcaacc tgggacttcc taaactttcc 2340
aaaaccttcc tctncnagca actgaacctc gccataaggc acttatccct ggttcctagc 2400
accccttatc ccctcagaat ccacaacttg taccaagttt cccttctccc agtccaagac 2460
ccaaaatcac cacaaaggac ccaatcccca gactcaagat atggtctggg cgctgtcttg 2520
tgtctcctac cctgatccct gggttcaact ctgctcccag agcatgaagc ctctccacca 2580
gcaccagcca ccaacctgca aacctaggga agattgacag aattcccagc ctttcccagc 2640
tcccctgcc catgtcccag gactcccagc cttggttctc tgccccctg tcttttcaaa 2700
cccacatcct aaatccatct cctatccgag tccccaagtt cctcctgtca accctgattc 2760
cctgatctta gcaccccctc tgcaggtgct gcacccctca tcctgtctcg gattgtggga 2820
ggctgggagt gcgagaagca ttcccaaccc tggcaggtgc ttgtggcctc tcgtggcagg 2880
gcagttgtcg gcggtgttct ggtgcacccc cagtgggtcc tcacagctgc ccactgcatc 2940
aggaacaaaa gcgtgatctt gctgggtcgg cacagcctgt ttcatcctga agacacagcc 3000
caggtatttc aggtcagcca cagcttcccc caccccgctct acgatatgag cctcctgaag 3060
aatcgattcc tcaggccagg tgatgactcc agccacgacc tcatgctgct ccgcctgtca 3120
gagcctgccg agctcacgga tgctgtgaag gtcatggacc tgcccaccca ggagccagca 3180
ctgggaccca cctgctacgc ctcaggctgg ggcagcattg zaccagagga gttcttgacc 3240
ccaaagaaac ttcagtgtgt ggacctccat gttatttcca atgacgtgtg tgcgcaagtt 3300
cacctcaga aggtgaccaa gttcatgctg tgtgctggac gctggacagg gggcaaaagc 3360
acctgctggg gtgattctgg gggcccactt gtctgtaatg gtgtgcttca acgtatcacg 3420
tcatggggca gtgaaccatg tgccctgccc gaaaggcctt cccigtacac caaggtggtg 3480
cattaccgga agtggatcaa ggacaccatc gtggccaacc cctgagcacc cctatcaact 3540
cccattgta gtaaacttgg aaccttggaa atgaccaggc caagactcaa gcctccccag 3600
ttctactgac ctttgtcctt aggtgtgacg tccagggttg ctaggaaaag aaatcagcag 3660
acacaggtgt agaccagagt gtttcttaaa tggtgtaatt ttgtcctctc tgtgtcctgg 3720
ggaatactgg ccatgcctgg agacatatca ctcaatttct ctgaggacac agataggatg 3780
gggtgtctgt gttatttgtg ggrtacagag atgaaagagg ggtgggwwcc acactgagag 3840
agtggagagt gacatgtgcc ggacactgtc catgaagcac tgagcagaag ctggaggcac 3900
aacgcaccag acactcacag caaggatgga gctgaaaaca taacccactc tgtcctggag 3960
gcactgggaa gcctagagaa ggctgtgagc caaggaggga gggtctncct ttggcatggg 4020
```

atggggatga agtaaggaga gggactggac cccctggaag ctgattcact atgggggggag 4080
gtgtattgaa gtcctccaga caacctcag atttgatgat ttcctagtag aactcacaga 4140
aataaagagc tsttatacgt ggtttattct ggtttgttac attgacagga gacacactga 4200
aatcagcaaa ggaaacaggc atctaagtgg ggatgtgaag aaaacaggga aaatctttca 4260
gttgttttct cccagtgggg tgttgtggac agcacttaaa tcacacagaa gtgatgtgtg 4320
accttgtgta tgaagtattt ccaactaagg aagctcacct gagccttagt gtccagagtt 4380
cttattgggg gtctgtagga taggcatggg gtactggaat agctgacctt aacttctcag 4440
acctgaggtt cccaagagtt caagcagata cagcatggcc tagagcctca gatgtacaaa 4500
aacaggcatt catcatgaat cgcactgtta gcatgaatca tctggcacgg cccaaggccc 4560
caggtatacc aaggcacttg ggccgaatgt tccaagggat taaatgtcat ctcccaggag 4620
ttattcaagg gtgagccctg tacttggaac gttcaggctt t 4661

<210> 3
<211> 3846
<212> DNA
<213> Homo sapiens

<400> 3
attttgcatg ccaccttaat cttttttttt ttttttttaa atcgaggttt cagtctcatt 60
ctatttccca ggctggagtt caatagcgtg atcacagctc actgtagcct tgaactcctg 120
gccttaagag attctcctgc ttcggtctcc caatagctaa gactacagta gtccaccacc 180
atatccagat aatttttaaa ttttttgggg ggccgggcac agtggctcac gcctgtaatc 240
ccaacaccat gggaggctga gatgggtgga tcacgaggtc aggagtttga gaccagcctg 300
accaacatgg tgaaactctg tctctactaa aaaaaaaaaa aatagaaaaa ttagccgggc 360
gtggtggcac acggcacctg taatcccagc tactgaggag gctgaggcag gagaatcact 420
tgaacccaga aggcagaggt tgcaatgagc cgagattgcg ccactgcact ccagcctggg 480
tgacagagtg agactctgtc tcaaaaaaaa aaaatttttt ttttttttgt gtagagatgg 540
atcttgcttt gttttctctgg ttggccttga actcctggct tcaagtgatc ctcctacctt 600
ggcctcggaa agtgttggga ttacaggcgt gagccaccat gactgacctg tcgttaatct 660
tgaggtacat aaacctggct cctaaaggct aaaggctaaa tatttgttgg agaaggggca 720
ttggattttg catgaggatg attctgacct gggagggcag gtcagcaggc atctctgttg 780
cacagataga gtgtacaggt ctggagaaca aggagtgggg ggttattgga attccacatt 840
gtttgctgca cgttggattt tgaaatgcta gggaactttg ggagactcat atttctgggc 900
tagaggatct gtggaccaca agatcttttt atgatgacag tagcaatgta tctgtggagc 960
tggattctgg gttgggagtg caaggaaaag aatgtactaa atgccaagac atctatttca 1020
ggagcatgag gaataaaagt tctagtttct ggtctcagag tggtgcaggg atcagggagt 1080
ctcacaatat cctgagtgct ggtgtcttag ggcacactgg gtcttggagt gcaaaggatc 1140
taggcacgtg aggctttgta tgaagaatcg gggatcgtac ccacccccctg tttctgtttc 1200
atcctgggcg rgtctcctct gccttttgtcc cctagatgaa gtctccatga gctacagggc 1260
ctggtgcatc cagggtgatc tagtaattgc agaacagcaa gtactagctc tcccticccct 1320
tccacagctc tgggtgtggg agggggttgt ccagcctcca gcagcatggg gagggccttg 1380
gtcagcctct gggtgccagc agggcagggg cggagtcctg gggaatgaag gttttatagg 1440
gctcctgggg gaggctcccc agccccaagc ttaccacctg cacccggaga gctgtgtcac 1500
cangtgggtc ccggttgtct tcctcaccct gtccgtgacg tggattggtg agaggggcca 1560
tggttggggg gatgcaggag agggagccag cccigactgt caagctgagg ctctttcccc 1620
cccaacccag cacccccagcc cagacaggga gctgggctct tttctgtctc tcccagcccc 1680
actccaagcc cataccccca gcccctccat attgcaacag tcctcactcc cacaccaggt 1740
ccccgctccc tcccacttac cccagaactt tctccccatt gcccagccag ctcctgctc 1800
ccagctgctt tactaaaggg gaagttcctg ggcatctccg tgtttctctt tgtggggctc 1860
aaaacctcca aggacctctc tcaatgccat tggttccttg gaccgtatca ctggtccacc 1920
tcctgaggcc ctcaatccta tcacagtcta ctgacttttc ccattcagct gtgctgcacc 1980
cctcatcctg tctcggattg tgggaggctg ggagtgcgag aagcattccc aacctggca 2040
ggtgcttgtg gcctctcgtg gcagggcagt ctgcggcggt gttctggtgc accccagtg 2100
ggtcctcaca gctgcccact gcatcaggaa caaaagcgtg atcttgctgg gtcggcacag 2160
cctgtttcat cctgaagaca caggccaggt atttcaggtc agccacagct tcccacaccc 2220
gctctacgat atgagcctcc tgaagaatcg attcctcagg ccaggtgatg actccagcca 2280
cgacctcatg ctgctccgcc tgtcagagcc tgccgagctc acggatgctg tgaaggtcat 2340
ggacctgccc acccaggagc cagcactggg gaccacctgc tacgcctcag gctggggcag 2400
cattgaacca gaggagttct tgaccccaaa gaaacttcag tgtgtggacc tccatgttat 2460
ttccaatgac gtgtgtgcgc aagttcaccc tcagaaggtg accaagttca tgctgtgtgc 2520

tggacgctgg acaggggcca aaagcacctg ctcgggtgat tctgggggcc cacttgtctg 2580
taatggntgg cttcaaggta tcacgtcatg gggcagtgaa ccatgtgccc tgcccgaaag 2640
gccttcgctg tacaccaagg tggtgcatta cgggaagtgg atcaaggaca ccatcgtggc 2700
caacccctga gcacccctat caactcccta ttgtagtaaa cttgcaacct tggaaatgac 2760
caggccaaga ctcaagcctc cccagttcta ctgacctttg tcctttaggtg tgaggtccag 2820
ggttgctagg aaaagaaatc agcagacaca ggtgtagacc agagtgtttc ttaaatggtg 2880
taatttttgtc ctctctgtgt cctggggaat actggccatg cctggagaca tatcactcaa 2940
tttctctgag gacacagata ggatgggggtg tctgtgttat ttgtgggrta cagagatgaa 3000
agaggggtgg gwwccacact gacagagtgg agagtgacat gtgctggaca ctgtccatga 3060
agcactgagc agaagctgga ggcacaacgc accagacact cacagcaagg atggagctga 3120
aaacataacc cactctgtcc tggaggcact gggaagccta gagaaggctg tgagccaagg 3180
agggagggtc tcccnnnggc atcggatggg gatgaagtaa ggagagggac tggacccctt 3240
ggaagctgat tcactatggg gggaggtgta ttgaagtcct ccagacaacc ctcagatttg 3300
atgatttcct agtagaactc acagaaataa agagctctta tacgtggttt attctggttt 3360
gttacattga caggagacac actgaaatca gcaaaggaaa caggcatcta agtggggatg 3420
tgaagaaaac agggaaaatc tttcagttgt tttctcccag tggggtgttg tggacagcac 3480
ttaaatcaca cagaagtgat gtgtgacctt gtgtatgaag tatttccaac taaggaagct 3540
cacctgagcc ttagtgtcca gagttcttat tgggggtctg taggataggc atggggtact 3600
ggaatagctg accttaactt ctcagacctg aggttcccaa gagttcaagc agatacagca 3660
tggcctagag cctcagatgt acaaaaacag gcattcatca tgaatcgcac tgttagcatg 3720
aatcatctgg cacggcccaa ggccccaggt ataccaaggc acttgggccg aatgttccaa 3780
gggattaaat gtcatctccc aggagttatt caagggtgag cctgtacttt ggaacgttca 3840
ggcttt 3846

<210> 4
<211> 1709
<212> DNA
<213> Homo sapiens

<400> 4
attttgcatg gcaccttaat cttttttttt ttttttttaa atcgaggttt cagtctcatt 60
ctatttccca ggctggagtt caatagcgtg atcacagctc actgtagcct tgaactcctg 120
gccttaagag attctcctgc ttcggtctcc caatagctaa gactacagta gtccaccacc 180
atatccagat aattttttaaa ttttttgggg ggccgggcac agtggctcac gcctgtaatc 240
ccaacaccat cgggaggctga gatgggtgga tcacgaggtc aggagtttga gaccagcctg 300
accaacatgg tgaaactctg tctctactaa aaaaaaaaaa aatagaaaaa ttagccgggc 360
gtggtggcac acggcacctg taatcccagc tactgaggag gctgaggcag gagaatcact 420
tgaacccaga aggcagaggt tgcaatgagc cgagattgcg ccactgcact ccagcctggg 480
tgacagagtg agactctgtc tcaaaaaaaa aaaatttttt ttttttttct gtagagatgg 540
atcttgcttt gtttctctgg ttggccttga actcctggct tcaagtgatc ctcctacctt 600
ggcctcggaa agtgttggga ttacaggcgt gagccaccat gactgacctg tcgttaatct 660
tgaggtacat aaacctggct cctaaaggct aaaggctaaa tatttgttgg agaaggggca 720
ttggattttg catgaggatg atttctgacct gggagggcag gtcagcagcc atctctgttg 780
cacagataga gtgtacaggt ctggagaaca aggagtgggg ggttattgga attccacatt 840
gtttgctgca cgttggattt tgaaatgcta gggaactttg ggagactcat atttctgggc 900
tagaggatct gtggaccaca agatcttttt atgatgacag tagcaatgta tctgtggagc 960
tggatttctgg gttgggagtg caaggaaaag aatgtactaa atgccaagac atctatttca 1020
ggagcatgag gaataaaagt tctagtttct ggtctcagag tggtgcaggg atcagggagt 1080
ctcacaatct cctgagtgct ggtgtcttag ggcacactgg gtcttggagt gcaaaggatc 1140
taggcacgng aggctttgta tgaagaatcg gggatcgtac ccacccctg tttctgtttc 1200
atcctgggcg tgtctcctct gccttgtcc cctagatgaa gtctccatga gctacagggc 1260
ctggtgcatc cagggtgatc tagtaattgc agaacagcaa gtactagctc tccctcccct 1320
tccacagctc tgggtgtggg aggggttgt ccagcctcca gcagcatggg gagggccttg 1380
gtcagcctct cggtgccagc agggcagggg cggagtcctg gggaatgaag gttttatagg 1440
gctcctgggg gaggctcccc agccccaagc ttaccacctg cacccggaga gctgtgtcac 1500
cctgtgggtc cnggttgtct tcctcacccc gtccgtgacg tggattggtg agaggggcca 1560
tggttgqggg gatgcaggag agggagccag ccctgactgt caagctgagg ctctttcccc 1620
cccaacccag cacccccagcc cagacaggga gctgggctct tttctgtctc tcccagcccc 1680
actccaactc cctgctccca gctgcttaa 1709

<210> 5
<211> 3423
<212> DNA
<213> Homo sapiens

<400> 5
attttgcatg ccaccttaat cttttttttt ttttttttaa atcgaggttt cagtctcatt 60
ctatttccca ggctggagtt caatagcgtg atcacagctc actgtagcct tgaactcctg 120
gcttaagag attctcctgc ttcggtctcc caatagctaa gactacagta gtccaccacc 180
atatccagat aatttttaaa ttttttgggg ggccgggcac agtggctcac gcctgtaatc 240
ccaacaccat gggagggctga gatgggtgga tcacgaggtc aggagtttga gaccagcctg 300
accaacatgg tgaaactctg tctctactaa aaaaaaaaaa aatagaaaaa ttagccgggc 360
gtggtggcac acggcacctg taatcccagc tactgaggag gctgaggcag gagaatcact 420
tgaacccaga aggcagaggt tgcaatgagc cgagattgcg ccactgcact ccagcctggg 480
tgacagagtg agactctgtc tcaaaaaaaa aaaattttt ttttttttt gtagagatgg 540
atcttgcttt gtttcatgg ttggccttga actcctggct tcaagtgatc ctcctacctt 600
ggcctcggaa agtgttggga ttacaggcgt gagccaccat gactgacctg tcgttaatct 660
tgaggtacat aaacctggct cctaaaggct aaaggctaaa tatttgttgg agaaggggca 720
ttggattttg catgaggatg attctgacct gggagggcag gtcagcaggc atctctgttg 780
cacagataga gtgtacaggt ctggagaaca aggagtgggg ggttattgga attccacatt 840
gtttgctgca cgttggattt tgaaatgcta gggaactttg ggagactcat atttctgggc 900
tagaggatct gtggaccaca agatcttttt atgatgacag tagcaatgta tctgtggagc 960
tggattctgg gttgggagtg caaggaaaag aatgtactaa atgccaagac atctatttca 1020
ggagccatgag gaataaaagt tctagtttct ggtctcagag tggtgcaggg atcagggagt 1080
ctcacaatct cctgagtgct ggtgtcttag ggcacactgg gtcttggagt gcaaaggatc 1140
taggcacgtg aggctttgta tgaagaatcg gggatcgtac ccacccctg tttctgtttc 1200
atcctgggcg tgtctcctct gcctttgtcc cctagatgaa gtctccatga gctacagggc 1260
ctggtgcatc cagggtgatc tagtaattgc agaacagcaa gtactagctc tccctccct 1320
tccacagctc tgggtgtggg aggggggttgt ccagcctcca gcagcatggg gagggccttg 1380
gtcagcctct gggtgccagc agggcagggg cggagtcctg gggaatgaag gttttatagg 1440
gctcctgggg gaggctcccc agccccaagc ttaccacctg cacccggaga gctgtgtcac 1500
catgtgggtc ccggttgtct tcctcaccct gtccgtgacg tggattggtg ctgcaccct 1560
catcctgtct cggattgtgg gaggctggga gtgcgagaag cattcccaac cctggcaggt 1620
gcttgtggcc tctcgtggca gggcagtctg cggcggtgtt ctggtgcacc cccagtgggt 1680
cctcacagct gcccactgcc tcaggaacaa aagcgtgatc ttgctgggtc ggcacagcct 1740
gtttcatcct gaagacacag gccaggtatt tcaggtcagc cacagcttcc cacacccgct 1800
ctacgatatg agcctcctga agaatcgatt cctcaggcca ggtgatgact ccagccacga 1860
cctcatgctg ctccgcctgt cagagcctgc cgagctcacg gatgctgtga aggtcatgga 1920
cctgcccacc caggagccag cactggggac cacctgctac gcctcaggct ggggcagcat 1980
tgaaccagag gagtttctga cccaaagaa acttcagtgt gtggacctcc atgttatttc 2040
caatgacgtg tgtgcgcaag ttcaccctca gaaggtgacc aagttcatgc tgtgtgctgg 2100
acgctggaca ggggtcaaaa gcacctgctc gggtgatttt ggggtcccac ttgtctgtaa 2160
tggtgtgctt caaggtatca cgtcatgggg cagtgaacca tgtgccctgc ccgaaaggcc 2220
ttcctgtacc accaaggtgc tgcattaccg gaagtggatc aaggacacca tcgtggccaa 2280
ccctgagcca ccctatcaa ctcctattg tagtaaactt ggaaccttgg aaatgaccag 2340
gccaagactc aagcctcccc agttctactg acctttgtcc ttaggtgtga ggtccagggt 2400
tgctaggaaa agaaatcagc agacacaggt gtagaccaga gtgtttctta aatggtgtaa 2460
ttttgtcctc tctgtgtcct ggggaatact ggccatgcct ggagacatat cactcaattt 2520
ctctgaggac acagatagga tggggtgtct gtgttatttg tgggrtacag agatgaaaga 2580
ggggtgggww ccacactgag agagtggaga gtgacatgtg ctggacactg tccatgaagc 2640
actgagcaga agctggaggc acaacgcacc agacactcac agcaaggatg gagctgaaaa 2700
cataacccac tctgtcctgg aggcactggg aagcctagag aaggctgtga gccaaggagg 2760
gagggttttc ctttggcatg ggatggggat gaagtaagga gagggactgg accccctgga 2820
agctgattca gtatgggggg aggtgtattg aagtcctcca gacaaccctc agatttgatg 2880
atttcctagt agaactcaca gaaataaaga gctsttatac gtggtttatt ctggtttgtt 2940
acattgacag gagacacact gaaatcagca aaggaaacag gcatctaagt ggggatgtga 3000
agaaaacagg gaaaatcttt cagttgtttt ctcccagtgg ggtgttgtgg acagcactta 3060
aatcacacag aagtgatgtg tgaccttgtg tatgaagtat ttccaactaa ggaagctcac 3120
ctgagcctta gtgtccagag ttcttattgg gggtctgtag gataggcatg gggtactgga 3180
atagctgacc ttaacttctc agaccctgagg ttcccaagag ttcaagcaga tacagcatgg 3240

cctagagcct cagatgtaca aaaacaggca ttcatcatga atcgcactgt tagcatgaat 3300
catctggcac ggcccaaggc cccaggtata ccaaggcact tgggccgaat gttccaaggg 3360
attaaatgtc atctcccagg agttattcaa gggtgagccc tgtacttgga acgttcaggc 3420
ttt 3423

<210> 6
<211> 1261
<212> DNA
<213> Homo sapiens

<400> 6
gggcgggctc ctggagaatg aaggctttat agggctcctc agggaggccc cccagcccca 60
aactgcacca cctggccgtg gacacctgtg tcagcatgtg ggacctggtt ctctccatcg 120
ccttgtcngt ggggtgcact ggtgagattg gggggataaa ggaaggggag cgggttctga 180
ctcttatgct gaagcccttt tcctcccacc cagtgcccca gcctcgtccc ttcagcccac 240
agttcagccc agacaatgtg ccgctgactc ttccacattg caatagtcct catgcccaca 300
ctaggtcccc gctcgctccc acttacctca gacctttctc tccattgccc agccaaatcc 360
ctgctcccag ctgctttact aaagagcaag ttcctaggca tctctgtgtt tctctttatg 420
gggttcaaaa cctttcaagg acctctctcc atgccactgg ttccttggac cctatcactg 480
gcctgcctcc tgagcccctc agtcctacca cagtctactg acttttccca ttcagctgtg 540
agcattcaac cctgtcccct ggaccttgac acctggctcc ccaaccctgt cccaggaaac 600
ccagattcca ccagacactt ccttcttccc ccccgaggct atctggcctg agacaacaaa 660
tgctgcctcc caccctgagt ctggcactgg gactttcaga actcctcctt ccctgactct 720
ttgccccaga cccgtcattc aatggctagc tttttccatg ggaagaagaa caacgagcac 780
ccccaaccac aacgggcagt tctctgattc cctaaatccg cacccttttc aaaacctcaa 840
aaacaaaaca aaacaaaaca aagcaagaaa caactcaggc aaaacttgtt gcttaacctt 900
ggacatggta aaccatccaa aaccttcctc tcccagcaac taaacctctc cactgggcac 960
ttaacctttg gtttcttgga acctcttaat ctcttagaac ccacagctgc caccacatgc 1020
cctttctccca atgtaagacc ccaaatcact ccaaatgacc caaccccccaa cccatgccct 1080
cttcagatat ttcccatgtc ccctactctg atctctgggg tcagctccgt tctcgagagc 1140
atgaagccta ccgacctggt ccagccacca accccgctaac gcagggaata gctacagaat 1200
tgccagccct cccaggaccc cttgcttgtg tcctggactc ccagtcctgg tcctctgccc 1260
c 1261

<210> 7
<211> 104
<212> PRT
<213> Homo sapiens

<400> 7
Met Trp Val Pro Val Val Phe Leu Thr Leu Ser Val Thr Trp Ile Gly
1 5 10 15

Glu Arg Gly His Gly Trp Gly Asp Ala Gly Glu Gly Ala Ser Pro Asp
20 25 30

Cys Gln Ala Glu Ala Leu Ser Pro Pro Thr Gln His Pro Ser Pro Asp
35 40 45

Arg Glu Leu Gly Ser Phe Leu Ser Leu Pro Ala Pro Leu Gln Ala His
50 55 60

Thr Pro Ser Pro Ser Ile Leu Gln Gln Ser Ser Leu Pro His Gln Val
65 70 75 80

Pro Ala Pro Ser His Leu Pro Gln Asn Phe Leu Pro Ile Ala Gln Pro
85 90 95

Ala Pro Cys Ser Gln Leu Leu Tyr

100

<210> 8
<211> 218
<212> PRT
<213> Homo sapiens

<400> 8
Met Lys Asn Arg Gly Ser Tyr Pro Pro Pro Val Ser Val Ser Ser Trp
1 5 10 15

Ala Cys Leu Leu Cys Leu Cys Pro Leu Asp Glu Val Ser Met Ser Tyr
20 25 30

Arg Ala Trp Cys Ile Gln Gly Asp Leu Val Ile Ala Glu Gln Gln Val
35 40 45

Leu Ala Leu Pro Pro Leu Pro Gln Leu Trp Val Trp Glu Gly Val Val
50 55 60

Gln Pro Pro Ala Ala Trp Gly Gly Pro Trp Ser Ala Ser Gly Cys Gln
65 70 75 80

Gln Gly Arg Gly Gly Val Leu Gly Asn Glu Gly Phe Ile Gly Leu Leu
85 90 95

Gly Glu Ala Pro Gln Pro Gln Ala Tyr His Leu His Pro Glu Ser Cys
100 105 110

Val Thr Met Trp Val Pro Val Val Phe Leu Thr Leu Ser Val Thr Trp
115 120 125

Ile Gly Glu Arg Gly His Gly Trp Gly Asp Ala Gly Glu Gly Ala Ser
130 135 140

Pro Asp Cys Gln Ala Glu Ala Leu Ser Pro Pro Thr Gln His Pro Ser
145 150 155 160

Pro Asp Arg Glu Leu Gly Ser Phe Leu Ser Leu Pro Ala Pro Leu Gln
165 170 175

Ala His Thr Pro Ser Pro Ser Ile Leu Gln Gln Ser Ser Leu Pro His
180 185 190

Gln Val Pro Ala Pro Ser His Leu Pro Gln Asn Phe Leu Pro Ile Ala
195 200 205

Gln Pro Ala Pro Cys Ser Gln Leu Leu Tyr
210 215

<210> 9
<211> 218
<212> PRT
<213> Homo sapiens

<400> 9
Met Lys Asn Arg Gly Ser Tyr Pro Pro Pro Val Ser Val Ser Ser Trp
1 5 10 15

Ala Cys Leu Leu Cys Leu Cys Pro Leu Asp Glu Val Ser Met Ser Tyr
20 25 30

Arg Ala Trp Cys Ile Gln Gly Asp Leu Val Ile Ala Glu Gln Gln Val
35 40 45

Leu Ala Leu Pro Pro Leu Pro Gln Leu Trp Val Trp Glu Gly Val Val
50 55 60

Gln Pro Pro Ala Ala Trp Gly Gly Pro Trp Ser Ala Ser Gly Cys Gln
65 70 75 80

Gln Gly Arg Gly Gly Val Leu Gly Asn Glu Gly Phe Ile Gly Leu Leu
85 90 95

Gly Glu Ala Pro Gln Pro Gln Ala Tyr His Leu His Pro Glu Ser Cys
100 105 110

Val Thr Met Trp Val Pro Val Val Phe Leu Thr Leu Ser Val Thr Trp
115 120 125

Ile Gly Glu Arg Gly His Gly Trp Gly Asp Ala Gly Glu Gly Ala Ser
130 135 140

Pro Asp Cys Gln Ala Glu Ala Leu Ser Pro Pro Thr Gln His Pro Ser
145 150 155 160

Pro Asp Arg Glu Leu Gly Ser Phe Leu Ser Leu Pro Ala Pro Leu Gln
165 170 175

Ala His Thr Pro Ser Pro Ser Ile Leu Gln Gln Ser Ser Leu Pro His
180 185 190

Gln Val Pro Ala Pro Ser His Leu Pro Gln Asn Phe Leu Pro Ile Ala
195 200 205

Gln Pro Ala Pro Cys Ser Gln Leu Leu Tyr
210 215

<210> 10
<211> 183
<212> PRT
<213> Homo sapiens

<400> 10
Met Lys Asn Arg Gly Ser Tyr Pro Pro Pro Val Ser Val Ser Ser Trp
1 5 10 15

Ala Cys Leu Leu Cys Leu Cys Pro Leu Asp Glu Val Ser Met Ser Tyr
20 25 30

Arg Ala Trp Cys Ile Gln Gly Asp Leu Val Ile Ala Glu Gln Gln Val
35 40 45

Leu Ala Leu Pro Pro Leu Pro Gln Leu Trp Val Trp Glu Gly Val Val
50 55 60

Gln Pro Pro Ala Ala Trp Gly Gly Pro Trp Ser Ala Ser Gly Cys Gln
65 70 75 80

```
Gln Gly Arg Gly Gly Val Leu Gly Asn Glu Gly Phe Ile Gly Leu Leu
                85                  90                  95

Gly Glu Ala Pro Gln Pro Gln Ala Tyr His Leu His Pro Glu Ser Cys
            100                 105                 110

Val Thr Met Trp Val Pro Val Val Phe Leu Thr Leu Ser Val Thr Trp
        115                 120                 125

Ile Gly Glu Arg Gly His Gly Trp Gly Asp Ala Gly Glu Gly Ala Ser
    130                 135                 140

Pro Asp Cys Gln Ala Glu Ala Leu Ser Pro Pro Thr Gln His Pro Ser
145                 150                 155                 160

Pro Asp Arg Glu Leu Gly Ser Phe Leu Ser Leu Pro Ala Pro Leu Gln
                165                 170                 175

Leu Pro Ala Pro Ser Cys Leu
            180
```

<210> 11
<211> 375
<212> PRT
<213> Homo sapiens

<400> 11

```
Met Lys Asn Arg Gly Ser Tyr Pro Pro Pro Val Ser Val Ser Ser Trp
  1               5                  10                  15

Ala Cys Leu Leu Cys Leu Cys Pro Leu Asp Glu Val Ser Met Ser Tyr
            20                  25                  30

Arg Ala Trp Cys Ile Gln Gly Asp Leu Val Ile Ala Glu Gln Gln Val
        35                  40                  45

Leu Ala Leu Pro Pro Leu Pro Gln Leu Trp Val Trp Glu Gly Val Val
    50                  55                  60

Gln Pro Pro Ala Ala Trp Gly Gly Pro Trp Ser Ala Ser Gly Cys Gln
65                  70                  75                  80

Gln Gly Arg Gly Gly Val Leu Gly Asn Glu Gly Phe Ile Gly Leu Leu
                85                  90                  95

Gly Glu Ala Pro Gln Pro Gln Ala Tyr His Leu His Pro Glu Ser Cys
            100                 105                 110

Val Thr Met Trp Val Pro Val Val Phe Leu Thr Leu Ser Val Thr Trp
        115                 120                 125

Ile Gly Ala Ala Pro Leu Ile Leu Ser Arg Ile Val Gly Gly Trp Glu
    130                 135                 140

Cys Glu Lys His Ser Gln Pro Trp Gln Val Leu Val Ala Ser Arg Gly
145                 150                 155                 160

Arg Ala Val Cys Gly Gly Val Leu Val His Pro Gln Trp Val Leu Thr
                165                 170                 175
```

Ala Ala His Cys Ile Arg Asn Lys Ser Val Ile Leu Leu Gly Arg His
180 185 190

Ser Leu Phe His Pro Glu Asp Thr Gly Gln Val Phe Gln Val Ser His
195 200 205

Ser Phe Pro His Pro Leu Tyr Asp Met Ser Leu Leu Lys Asn Arg Phe
210 215 220

Leu Arg Pro Gly Asp Asp Ser Ser His Asp Leu Met Leu Leu Arg Leu
225 230 235 240

Ser Glu Pro Ala Glu Leu Thr Asp Ala Val Lys Val Met Asp Leu Pro
245 250 255

Thr Gln Glu Pro Ala Leu Gly Thr Thr Cys Tyr Ala Ser Gly Trp Gly
260 265 270

Ser Ile Glu Pro Glu Glu Phe Leu Thr Pro Lys Lys Leu Gln Cys Val
275 280 285

Asp Leu His Val Ile Ser Asn Asp Val Cys Ala Gln Val His Pro Gln
290 295 300

Lys Val Thr Lys Phe Met Leu Cys Ala Gly Arg Trp Thr Gly Gly Lys
305 310 315 320

Ser Thr Cys Ser Gly Asp Ser Gly Gly Pro Leu Val Cys Asn Gly Val
325 330 335

Leu Gln Gly Ile Thr Ser Trp Gly Ser Glu Pro Cys Ala Leu Pro Glu
340 345 350

Arg Pro Ser Leu Tyr Thr Lys Val Val His Tyr Arg Lys Trp Ile Lys
355 360 365

Asp Thr Ile Val Ala Asn Pro
370 375

<210> 12
<211> 141
<212> PRT
<213> Homo sapiens

<400> 12
Met Trp Asp Leu Val Leu Ser Ile Ala Leu Ser Val Gly Cys Thr Gly
1 5 10 15

Glu Ile Gly Gly Ile Lys Glu Gly Gly Arg Val Leu Thr Leu Met Leu
20 25 30

Lys Pro Phe Ser Ser His Pro Val Pro Gln Pro Arg Pro Phe Ser Pro
35 40 45

Gln Phe Ser Pro Asp Asn Val Pro Leu Thr Leu Pro His Cys Asn Ser
50 55 60

Pro His Ala His Thr Arg Ser Pro Leu Pro Pro Thr Tyr Leu Arg Pro
65 70 75 80

Phe Ser Pro Leu Pro Ser Gln Ile Pro Ala Pro Ser Cys Phe Thr Lys
85 90 95

Glu Gln Val Pro Arg His Leu Cys Val Ser Leu Tyr Gly Val Gln Asn
100 105 110

Leu Ser Arg Thr Ser Leu His Ala Thr Gly Ser Leu Asp Pro Ile Thr
115 120 125

Gly Leu Pro Pro Glu Pro Leu Ser Pro Thr Thr Val Tyr
130 135 140